Title Combining ability of fruit appearance and eating quality in pears

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Abstract

Combining abilities for fruit appearance and eating quality were estimated for 14 pear genotypes and their derived families used in the Australian pear breeding programme. Data from sensory assessment of 30 and 35 families in 2002 and 2003, respectively, was used in the analysis. Mean quality scores skewed to poor fruit appearance and eating quality. There was no correlation between fruit appearance and eating quality in either year. Large variations were observed in 2003 for both attributes and for estimates of GCA and SCA effects. All parents had zero GCA effect for eating quality. Narrow-sense heritability estimates ranged from 0.10 to 0.29 for fruit appearance and were zero for eating quality. The rankings of GCA effects of parents were moderately correlated between seasons (r^2=0.36, P<0.05). 'Butirra Precoce Morettini (BPM)', 'Eldorado', 'Guyot' and 'Corella' showed large GCA effects for better fruit appearance, but 'Packham's Triumph', 'Comice' and 'Winter Cole' showed GCA effects for poor appearance. SCA effects contributed to better fruit appearance and eating quality in 8 out of 23 families assessed in both seasons. Rank correlation was significant but weak for SCA effects of eating quality across seasons (r^2=0.18, P<70.05). The results indicate that good genetic gain can be obtained based on phenotypic selection for fruit appearance using a 9-point hedonic scale for fruit assessment. Selection for good eating quality can be successful within families with large and desired SCA effects over seasons.